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APPLICATION

FOR UNITED STATES LETTERS PATENT

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT WE, **JAMES T. DISHON**, a citizen of UNITED STATES OF AMERICA, and **ANTHONY C. JOHNSON**, a citizen of UNITED STATES OF AMERICA, have invented a new and useful **MATERIAL CUTTING AND FEEDING MACHINE** of which the following is a specification:

MATERIAL CUTTING AND FEEDING MACHINE

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BACKGROUND OF THE INVENTION

Field of the Invention

10 The present invention relates to paper cutting machines and more particularly pertains to a new material cutting and feeding machine for cutting and perforating a roll of paper.

15 Description of the Prior Art

The use of paper cutting machines is known in the prior art. More specifically, paper cutting machines heretofore devised and utilized are known to consist basically of familiar, expected and obvious structural configurations, notwithstanding the myriad of designs encompassed by the crowded prior art which have been developed for the fulfillment of countless objectives and requirements.

25 Known prior art includes U.S. Patent No. 5,235,882; U.S. Patent No. 5,431,077; U.S. Patent No. 3,986,419; U.S. Patent No. 4,907,014; U.S. Patent Des. No. 340,067; and U.S. Patent No. 4,293,236.

30 While these devices fulfill their respective, particular objectives and requirements, the aforementioned patents do not disclose a new material cutting and feeding machine. The inventive

device includes a generally rectangular frame. A material feeding roller is mounted to the frame. The feeding roller is adapted to hold a roll of paper. A motor is adapted to rotate a draw roller assembly that draws the paper from the paper roll. A cutting means 5 is mounted adjacent to the draw roller. The cutting means comprises a latitudinal perforating bar adapted to perforate the paper along a width of the paper, a perforating wheel adapted to perforate a length of the paper, and a latitudinal cutting bar adapted to cut the paper along the width of the paper. A guide roller 10 assembly comprised of four rollers and two guides is orientated to feed the paper from the paper cutter to an exit in the frame.

In these respects, the material cutting and feeding machine according to the present invention substantially departs from the conventional concepts and designs of the prior art, and in so doing provides an apparatus primarily developed for the purpose of cutting and perforating a roll of paper.

SUMMARY OF THE INVENTION

20 In view of the foregoing disadvantages inherent in the known types of paper cutting machines now present in the prior art, the present invention provides a new material cutting and feeding machine construction wherein the same can be utilized for cutting 25 and perforating a roll of paper.

The general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new material cutting and feeding machine apparatus and method which 30 has many of the advantages of the paper cutting machines mentioned heretofore and many novel features that result in a new material cutting and feeding machine which is not anticipated,

rendered obvious, suggested, or even implied by any of the prior art paper cutting machines, either alone or in any combination thereof.

To attain this, the present invention generally comprises a generally rectangular frame. A material feeding roller is mounted to the frame. The feeding roller is adapted to hold a roll of paper. A motor is adapted to rotate a draw roller assembly that draws the paper from the paper roll. A cutting means is mounted adjacent to the draw roller. The cutting means comprises a latitudinal perforating bar adapted to perforate the paper along a width of the paper, a perforating wheel adapted to perforate a length of the paper, and a latitudinal cutting bar adapted to cut the paper along the width of the paper. A guide roller assembly comprised of four rollers and two guides is orientated to feed the paper from the paper cutter to an exit in the frame.

There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are additional features of the invention that will be described hereinafter and which will form the subject matter of the claims appended hereto.

In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and

terminology employed herein are for the purpose of description and should not be regarded as limiting.

As such, those skilled in the art will appreciate that the
5 conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not
10 depart from the spirit and scope of the present invention.

Further, the purpose of the foregoing abstract is to enable the U.S. Patent and Trademark Office and the public generally, and especially the scientists, engineers and practitioners in the art who
15 are not familiar with patent or legal terms or phraseology, to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The abstract is neither intended to define the invention of the application, which is measured by the claims, nor is it intended to be limiting as to the
20 scope of the invention in any way.

It is therefore an object of the present invention to provide a new material cutting and feeding machine apparatus and method which has many of the advantages of the paper cutting machines
25 mentioned heretofore and many novel features that result in a new material cutting and feeding machine which is not anticipated, rendered obvious, suggested, or even implied by any of the prior art paper cutting machines, either alone or in any combination thereof.

30 It is another object of the present invention to provide a new material cutting and feeding machine which may be easily and efficiently manufactured and marketed.

It is a further object of the present invention to provide a new material cutting and feeding machine which is of a durable and reliable construction.

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An even further object of the present invention is to provide a new material cutting and feeding machine which is susceptible of a low cost of manufacture with regard to both materials and labor, and which accordingly is then susceptible of low prices of sale to 10 the consuming public, thereby making such material cutting and feeding machine economically available to the buying public.

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Still yet another object of the present invention is to provide a new material cutting and feeding machine which provides in the apparatuses and methods of the prior art some of the advantages thereof, while simultaneously overcoming some of the disadvantages normally associated therewith.

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Still another object of the present invention is to provide a new material cutting and feeding machine for cutting and perforating a roll of paper.

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Yet another object of the present invention is to provide a new material cutting and feeding machine which includes a generally rectangular frame. A material feeding roller is mounted to the frame. The feeding roller is adapted to hold a roll of paper. A motor is adapted to rotate a draw roller assembly that draws the paper from the paper roll. A cutting means is mounted adjacent to the draw roller. The cutting means comprises a latitudinal 30 perforating bar adapted to perforate the paper along a width of the paper, a perforating wheel adapted to perforate a length of the paper, and a latitudinal cutting bar adapted to cut the paper along

the width of the paper. A guide roller assembly comprised of four rollers and two guides is orientated to feed the paper from the paper cutter to an exit in the frame.

5 Still yet another object of the present invention is to provide a new material cutting and feeding machine that will allow users to use rolls of paper which can be cut down into pieces of paper smaller than a standard sheet to save on resources.

10 Even still another object of the present invention is to provide a new material cutting and feeding machine that will perforate the paper both along a width and a length. The ability to perforate the paper allows the user multiple uses such as creation of billing statements from regular stock paper.

15 These together with other objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be made to the accompanying drawings and descriptive matter in which there are illustrated preferred embodiments of the invention.

25 **BRIEF DESCRIPTION OF THE DRAWINGS**

The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such
30 description makes reference to the annexed drawings wherein:

Figure 1 is a schematic perspective view of a new material cutting and feeding machine according to the present invention.

Figure 2 is a schematic side view of the present invention.

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Figure 3 is a schematic expanded view of the cutting mechanism of the present invention.

Figure 4 is a schematic cross-section view of the cutting 10 blade of the present invention.

Figure 5 is a schematic cross-section view the perforating blade of the present invention.

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Figure 6 is a schematic front view of the perforating wheel of the present invention.

Figure 7 is a schematic plan view of paper cut using the present invention.

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DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the drawings, and in particular to 25 Figures 1 through 7 thereof, a new material cutting and feeding machine embodying the principles and concepts of the present invention and generally designated by the reference numeral 10 will be described.

As best illustrated in Figures 1 through 7, the material cutting 30 and feeding machine 10 generally comprises a rectangular frame 11 wherein the frame has an inside portion 13 and an outside portion 14. The frame supports a first 15, second 16 and third 17 paper cutting and delivering means.

The first paper cutting and delivering means comprises a material feeding roller means 18 wherein the roller means is attached to the outside portion of the frame. The feeding roller means is adapted to feed a continuous roll of paper 19 into the 5 frame such that the paper is horizontal to the floor.

Preferably, a pressing means is mounted to the inside of the frame wherein the pressing means is adapted to flatten the paper. Pressing the paper allows it to travel smoother through a cutting apparatus without the edges of the paper curling. The pressing 10 means is adjacent to the feeding means. The pressing means is comprised of a first draw roller assembly 20, a tension roller 21 and a second draw roller assembly 22. The tension roller has a spring 23 attached thereto adapted to apply downward tension on the tension roller. The first and the second draw roller assemblies 15 are comprised of two rollers. Preferably, the second draw roller is in fluid connection with a sensor 25. The sensor rotates the second draw roller to pull the paper into the frame. The sensor is adapted to measure a length of the paper for cutting purposes. The machine can be set up without only one draw roller assembly which can pull 20 the paper into the machine. Also, the sensor is optional as the machine can be adapted to use a standard length of paper for cutting purposes.

a On B1 A motor 27 is preferably rotationally coupled to the sensor 25 means. The motor means rotates the sensor means. If a sensor is 25 not used, then the motor is coupled to one of the draw rollers directly.

28 A cutting means is mounted adjacent to the second draw roller 22. The cutting means comprises a longitudinal perforating wheel 30 adapted to perforate the paper along a length of the paper, a 30 latitudinal perforating bar 32 adapted to perforate the paper along a

width of the paper, and a latitudinal cutting bar 34 adapted to cut the paper along the width of the paper. Ideally, all three cutters are included, however, only the cutting bar is required. All three sit in a casing 36. The casing has two sub-casings 31, 33 which lift up 5 the bar cutters when they are not being used and engages the cutters when cutting is required. The perforating wheel is attached to a belt 35 which pulls the wheel to the left or right depending on where the user would like vertical perforations in the page. In another embodiment, not shown, a plurality of perforation wheels 10 are used.

A paper holder 38 is mounted in the frame. The paper holder is slidably mounting into the frame so that the paper holder can be accessed by pulling the paper holder from the frame. The paper holder has a handle 39 to pull the holder out with.

15 A first guide roller assembly mounted between the cutting means and the paper holder comprises two rollers 40 and two guide 42 bars adapted to direct the paper into the paper holder.

20 A second guide roller assembly comprised of four rollers 44 and two guides 46 is adapted to feed the paper from the paper holder to an exit in the frame.

The second 16 and the third 17 paper cutting and delivery means are substantially identical to the first paper cutting and delivery means. The second means is mounted below the first means, and the third means is mounted below the second means 25 whereby all three cutting and delivery means are mounted parallel to each other and all direct paper from a first end 48 of the frame to a second end 49 of the frame. Preferably, the paper holder 50 of the second means is larger than the paper holder 38 of the first means. A paper holder 51 of the third means is larger than the 30 paper holder of the second means 50.

The exit in the frame comprises two rollers 55 and an opening ⁵⁶
in the frame ¹¹~~56~~. The exit is adapted to receive paper from each of
the cutting and delivery means.

An actuating means 60 is operationally coupled to each of the
5 cutting means and to each of the motor means. Preferably, the
actuating means is ^{includes} ~~in the form of~~ a keypad 62 and is adapted to be
programmable for variable cutting and perforating patterns.

All rollers depicted in the figures are cylindrical in shape.

All parts can be mounted to the frame by any mounting means
10 known in the art, however, bolts and screw work ideally as they can
be removed for repair or refitting. The frame can be sized
according to its use for either printers or copiers.

In use, the user loads paper onto the feeding roller 18.

Though not preferred, single sheets can be fed through the opening
15 used by the feeding roller as the machine will still perforate and
cut single sheets of paper. The paper is fed through the draw
rollers 20, 22 and the tension roller 21. The second draw roller 22
rotates as the sensor 25 which is attached to it rotates. The sensor
determines the length of paper to enter the frame depending on the
20 particular program selected. As the paper is fed through the
cutters, perforations and cuts are made in the paper as directed by
the programmer. The paper then travels through the guide rollers
42 to the paper tray 38. This tray can store paper cut by the
machine for later use, or it can be opened and precut paper can be
placed into the holder. The paper next enters the next set of guide
25 rollers 44 and is fed to the exit out the back side 49 of the frame
and into a printer or copier. Figure 7 most clearly demonstrates the
result of running paper through the machine. The dashed lines
indicated perforations. The dashed line 70 running in the direction
30 of paper feeding is made with the perforation wheel. The other

perforated line 71 is made with the perforation bar. The solid cut 72 is made with the cutting bar.

As to a further discussion of the manner of usage and
5 operation of the present invention, the same should be apparent
from the above description. Accordingly, no further discussion
relating to the manner of usage and operation will be provided.

With respect to the above description then, it is to be realized
10 that the optimum dimensional relationships for the parts of the
invention, to include variations in size, materials, shape, form,
function and manner of operation, assembly and use, are deemed
readily apparent and obvious to one skilled in the art, and all
equivalent relationships to those illustrated in the drawings and
15 described in the specification are intended to be encompassed by
the present invention.

Therefore, the foregoing is considered as illustrative only of
the principles of the invention. Further, since numerous
20 modifications and changes will readily occur to those skilled in the
art, it is not desired to limit the invention to the exact construction
and operation shown and described, and accordingly, all suitable
modifications and equivalents may be resorted to, falling within the
scope of the invention.